

ROLE OF F.E.S.S. IN CHRONIC SINUSITIS

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ABSTRACT: Functional endoscopic sinus surgery (FESS) is a new and exciting treatment for chronic sinus disease. A prospective study of 50 patients undergoing FESS was undertaken at the department of Otolaryngology, Dayanand Medical College & Hospital, Ludhiana. Parameters studied included patient symptoms, medical history, medical therapy, radiologic findings, complications and postoperative symptoms. 62% of our patients had sinonasal polypi (ethmoidal polypi 56%, antrochoanal polypi 6%) while 38% had chronic sinusitis. Osteomeatal complex involvement (88%) was the most common preoperative CT scan findings. All the cases were subsequently subjected to functional endoscopic sinus surgery, studied for post-operative complications and 82% of the patients achieved improvement in pre-operative symptoms. It was concluded that FESS is a highly successful treatment for chronic sinus disease.

Key words: Functional Endoscopic Sinus Surgery (FESS), Sinonasal polyp, Chronic sinusitis, Osteomeatal complex, Synechia, Polyp recurrence.

INTRODUCTION

Functional endoscopic sinus surgery (FESS) has become an increasingly popular treatment for chronic sinus disease. Advances in technology with the development of small fiberoptic endoscopes and computerized tomography (CT) scanning of the paranasal sinuses have allowed a more direct and accurate study of sinus disease that was impossible previously. In chronic sinus disease, viral, allergic, bacterial and other inflammatory process affect sinus mucosa leading to edema of the mucosa in the region of osteomeatal complex. Osteomeatal complex is an area where frontal, maxillary and anterior ethmoids drain. This small area is key to proper physiological functions of the sinuses. The obstruction of mucociliary clearance in this area, tissue hypoxia, stasis of secretions, bacterial overgrowth and cycle of worsening inflammation and obstruction then leads to irreversible changes in sinus mucosa which will then require surgical debridement [1,2,3]. This goal is achieved primarily by the endoscopic removal of disease from key areas of the anterior ethmoid and middle meatus. It reestablishes the ventilation, mucociliary clearance and the return of normal functioning of the sinuses [4].

MATERIAL AND METHODS

Fifty patients belonging to all age groups were selected from the out patient and in patient department of Otolaryngology for endoscopic sinus surgery. Patients of chronic sinusitis in whom conservative therapy in the form of medical treatment for three months had failed were taken up for surgery & the patients who had orbital or intracranial complications due to sinusitis were excluded from this study. A detailed clinical history and examination was performed, X-ray Paranasal sinuses (water's view) and CT scan Paranasal sinuses (axial and coronal view) were obtained. Lund & Mackay system of scoring (1993) was used for staging of preoperative and postoperative symptoms, CT scan findings and operative procedures. All the cases were subjected to functional endoscopic sinus surgery using Messerklinger technique under general anaesthesia. The study was carried out over a period of two years (Jan.2000 to Dec.2001) and the patients were followed up for a minimum period of 6 months.

OBSERVATIONS & RESULTS

The patients presenting were in the range of 5 - 65 years and the mean age of presentation was 35 years. 33 were males and 17 were females. It was found that 28 patients suffered from ethmoidal polypi (10 unilateral and 18 bilateral). 3 patients had unilateral antrochoanal polyp. 19 patients had chronic sinusitis (11 unilateral and 8 bilateral).

Nasal blockade (86%) was the most common complaint followed by headache (78%). Patients having antrochoanal polypi complained chiefly of unilateral nasal obstruction and nasal discharge, while patients with ethmoidal polypi complained of nasal and allergic symptoms [Table No-I].

CT scan paranasal sinuses (5mm sections, axial and coronal view) was obtained in all the patients. The most common anatomic variation was deviated nasal septum, while the most common mucosal abnormality was in the anterior osteomeatal unit [Table No.-II & III].

Diagnostic nasal endoscopy was carried out preoperatively which revealed mucopurulent discharge in middle meatus and ethmoidal polypi as the most common findings blocking the visualization of osteomeatal unit.

Uncinectomy and infundibulotomy was carried out in all the patients. The most common procedure was endoscopic polypectomy along with anterior and posterior ethmoidectomy in 15 patients (30%) using Messerklinger technique. All types of procedures including septoplasties, frontal and sphenoid sinus exploration were undertaken depending upon the extent of disease involvement [Table No.-IV].

No major complications were recorded in any patient operated upon. Post-operative bleeding requiring packing was present in 6 patients (12%). The most common complications after 6 months of follow-up of patients were synechia formation between middle turbinate and lateral nasal wall in 7 patients (14%) and recurrence of polypi in 5 out of 28 patients (18%) which was confirmed by



Fig 1: Preoperative photography of CT scan of a patient



Fig 2.: Post operative CT scan

nasal endoscopy. Least common complication was periorbital edema or ecchymosis seen in 3 patients (6%).

Forty-eight patients were followed up for a minimum period of 6 months and two were lost to follow - up. The complaints of post-nasal discharge and nasal blockade were relieved in 86% and 83% of patients respectively and the rest of the complaints were also relieved in almost same percentage of patients.

Overall, 70% of the patients undergoing surgery felt marked improvement in their symptoms while 8% had moderate and 4% had mild improvement whereas 18% had no improvement or worsening of symptoms after undergoing functional endoscopic sinus surgery [Figs 1 & 2].

DISCUSSION

Functional endoscopic sinus surgery has revolutionized the treatment of sinonasal disease as it reestablishes ventilation and mucociliary clearance by limited resection of inflammatory or anatomical defect at the osteomeatal complex area[5].

Endoscopic sinus surgery has several advantages over more conventional techniques, like Caldwell-Luc etc. First, the patient is spared the additional trauma of external skin or mucous membrane incisions and the accompanying removal of intervening bone. Second, as with the use of the microscope in ear surgery, endoscopes permit unparalleled visualization of the sinuses and the anatomy of the lateral nasal wall. Third, improved visualization allows more accurate diagnosis of malformations or obstructing masses, such as polyps, in the osteomeatal region. Fourth, there is precise removal of sinus disease with preservation of mucous membrane and restoration of normal mucociliary transport[6].

In spite of the above mentioned advantages there were a few complications such as synechiae formation between the middle turbinate and lateral wall of the nose (14%).

The recurrence of polypi (18%) probably is due to the allergic component of the disease. The recurrence rates were less than

those of Frisch et al (7) (35.9%). These rates were comparatively less because of the frequent removal of small polyps, granulation tissues during routine post operative visits.

A few measures can be helpful in minimizing the tendency of synechiae formation which include first, the agger nasice and mucous membrane at the angle formed by the anterior attachment of the middle turbinate and the lateral nasal wall should be partially removed. Second, loose fragments of bone and mucous membrane should be excised from the ethmoid sinus and lateral aspect of the middle turbinate. Third, the mucous membrane on the lateral free surface of the middle turbinate should be preserved and adhesion formation was promoted between medial surface and nasal septum (Bolgerization). Fourth, partial middle turbinectomy if needed may be carried out in some cases. Stammberger, Messerklinger and Kennedy have at times recommended against routine resection of the middle turbinate to prevent the loss of important surgical landmark for revision surgery. But it is believed that base of the middle turbinate can still be used as a landmark throughout the procedure and can even be used as a landmark for revision procedures. Anosmia/hyposmia or atrophic rhinitis did not occur. Wigand has reported that in several thousand operations he has not had a single case of atrophic rhinitis [5],

Table 1: Presenting Complaints of patients (n=50)

Chief Complaint	No. of patients	% age
Nasal Blockade	43	86%
Headache or facial pain	39	78%
Post nasal drip	37	74%
Anterior Nasal discharge	31	62%
Swelling over maxillary		
antrum,	10	20%
medial canthus of eye,		
deformity		
Disturbances of smell	5	10%

Table 2: C T Scan detection of Anatomic Variations

Anatomic variation	U/L		B/L		Total	% age
	Pts.	% age	Pts.	% age		
Concha bullosa	5	10%	3	6%	8	16%
Paradoxical middle turbinate	3	6%	2	4%	5	10%
Curved uncinate process	2	4%	1	2%	3	6%
Overpneumatized ethmoidal bulla	4	8%	3	6%	7	14%
Haller cells	4	8%	4	8%	8	16%
Agger Nasi cells.	-	-	20	40%	20	40%
Onodi Cells	2	4%	1	2%	3	6%
Lamina papyracea pushed laterally	-	-	2	4%	2	4%
Maxillary sinus septae	1	2%	2	4%	3	6%
Pneumatization of vomer	1	2%	-	-	1	2%
Septal deviation/ Spurs					22	44%

Table 3: C T Scan detection of Abnormalities

Mucosal Abnormalities	U/L		B/L		Total	% age
	Pts.	% age	Pts.	% age		
Ethmoidal polyp	10	20%	18	36%	28	56%
Antrochaonal polyp	3	6%	-	-	3	6%
Maxillary antra	12	24%	13	26%	25	50%
Anterior Osteomeatal Unit	23	45%	21	42%	44	88%
Posterior ethmoids	15	30%	18	36%	33	66%
Frontal Sinuses	9	18%	7	14%	16	32%
Sphenoid Sinuses	6	12%	3	6%	9	18%

Table 4: Procedures

Procedure	U/L	B/L	Total
Anterior Ethmoidectomy	6	4	10
Total Ethmoidectomy	16	21	37
Polypectomy	13	18	31
Sphenoidotomy	6	2	8
Frontal Sinus Exploration	3	6	9
Septoplasty			11

Our results were consistent with those of Stammberger(8) (85%), Levine[9] (82.4%), Smith and Brindley [5] (88%), Frisch et al[7] (82%) and less than those of Kennedy et al (10) (98.4%).

One of the reasons for greater success was the use of preoperative CT Scan and atraumatic technique which is the basic component of functional endoscopic sinus surgery.

CONCLUSIONS

Obstruction in the osteometal unit hampers mucociliary drainage leading to chronic sinusitis. The microanatomy of osteomeatal complex and other hidden areas can be easily defined by CT scan paranasal sinuses which acts as a roadmap for surgery. Functional endoscopic sinus surgery brings about restoration of natural mucociliary clearance mechanism, drainage and aeration of sinuses, and resolution of apparently irreversible polypoidal mucosa without interfering with the normal mucosa of the sinuses.

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